CITY OF OAKLAND
AGENDA REPORT

TO: Office of the City Administrator
ATTN: Dan Lindheim
FROM: Department of Information Technology
DATE: Dec. 1, 2009

RE: **An Informational Report From The Department Of Information Technology
         With An Update On Interoperability And P-25 Compliance For The City's 800
         MHz Radio Communication System.**

SUMMARY

This is an informational report that was requested by the Public Safety Committee on Sep 29, 2009. This report includes Radio communication system background information and status update on the Oakland Project 25 upgrade roadmap for voice interoperability. This report also includes findings and recommendations based on the study conducted by a consulting firm, CTA Communications, regarding the Interoperability with the East Bay Regional Communications System (EBRCS) and Bay Area Regional Interoperable Communications System (BayRICS) in order to achieve Project 25 compliance and maintainability of the Radio system in Oakland[1]. The City is moving forward with the Hybrid P-25 deployment strategy due to following two reasons:

1. Keep the backward compatibility and current operability intact with some of the critical partners i.e. BART, Cities of Piedmont and Emeryville who are not considering the P-25 migration in the near future
2. Take advantage of the P-25 standards for the regional interoperability and seamless roaming in the Bay Area

The staff projects that the Project 25 deployment in Oakland will be completed by 2011, provided that all the current grant funding proposals are awarded.

FISCAL IMPACT

This is an informational report on the status of Oakland's Public Safety Voice Communications Interoperability plans and there is no fiscal impact.

BACKGROUND

The City of Oakland has made great strides in Public Safety Voice Communications since 1991. The City's Department of Information Technology (DIT) has ensured that Oakland's investments in the City's 800 MHz Radio system were cost effective, efficient and met national standards. Moreover, DIT ensured the emergency communications infrastructure; radio

[1] *The CTA Interoperability Study Report is
available on the City Web site.*

equipment and emergency plans were flexible enough to meet the changing landscape of public safety emergency communications technologies.

In 1993, the City of Oakland built its 800 MHz Radio System. The system was competitively bid in cooperation with Alameda County and was designed keeping a "system of systems" approach in mind for flexibility and augmentation in future years. At that time it was built to exceed daily operations and to meet future emergency communication needs. Over $23 million dollars have gone into the building of an emergency communications system that was robust, functional and scalable.

The City of Oakland Radio Communication system is an 800 MHz digital trunked radio system maintained by the Department of Information Technology (DIT). The Radio Communication equipment is provided by Harris Corporation (formerly owned by M/A-COM, Tyco Electronics), which supports the mission critical voice communication needs of the Oakland Police Department, Oakland Fire Department, Public Works Agency, Oakland Unified School District, Emeryville Fire Department, City of Piedmont Fire and Police Departments and numerous other local and state agencies within the City of Oakland. The City of Oakland has made significant investment in its current radio system infrastructure to move forward with the Project 25 (P-25) voice interoperability in the Bay Area region. Another notable Oakland investment is the P-25 capable subscriber units, as these subscriber units represent almost 90% of the current dollar value of the City of Oakland radio system. They also position the City to move toward a P-25 system without incurring a large subscriber unit cost. The subscriber units also have the added advantage in that they are compatible with any P-25 standards based infrastructure, including EADS, EF Johnson, and Motorola. The City has several well established and well maintained radio sites, some of them have been in operations for more than two decades. These radio sites are critical to the smooth and speedy upgrade of the P-25 voice interoperability Bay Area regional plan, due to many reasons including, approved zoning, FCC licensed sites, known good microwave path profiles, and site conditions for further development. The City of Oakland geographically distributed radio sites, APL, SENECA and GWIN, provide coverage, capacity, and redundancy all over the City.

The Oakland Public Safety Emergency Communications Radio System was upgraded in 1998, 2003 and 2008. The system upgrades were made to ensure Project 25 (P-25) compliance and to ensure that 800 MHz and 700MHz radios would work with the system. The system was also designed to ensure redundant operation of Police and Fire as well as overlapping radio system site coverage to account for disaster emergency communications needs.

APCO PROJECT 25

Project 25 (P-25) was initiated in 1989 as a cooperative standards development between the Association of Public Safety Communications officials (APCO) and the Telecommunications Industry Association (TIA). In January of 1993, APCO Project 25 moved forward by adopting a proposed system architecture through eight interface standards that would determine the future of

digital technology for use in the United States public safety markets. The first of these interfaces to be defined was the critically important Common Air Interface (CAI). In P-25 Phase I, CAI created the standards that ensure basic radio-to-radio digital interoperability and compatibility. This means that in an APCO Project 25-compliant system, mobile and portable equipment from any manufacturer were capable of communicating with any radio infrastructure.

The purpose of P-25 was to develop a suite of standards for digital radio communications used by federal, state, and local public safety agencies to promote interoperability among digital land mobile radio systems.

KEY ISSUES AND IMPACTS

In Oakland, the main goal of the P-25 technology roadmap is to gradually upgrade the radio system without disrupting the current operations and impacting the live interfaces. This goal is best described as a gradual migration to P-25 via EDACS which is why it is being described as a "hybrid" approach. The staff is working on this Hybrid P-25 technology roadmap with various grant funding sources to complete the migration of the current radio system infrastructure in the City of Oakland to bring it to P-25 standards for its voice communications.

The City of Oakland has selected this Hybrid P-25 Phased Deployment approach to achieve the following three (3) major accomplishments:

1. ***Continued ability for voice interoperability with non P25 subscribers during the Project 25 Migration and Upgrade***

BART is one of our critical radio communication agency partners who is currently on the EDACS system and does not plan to go to P25 for at least 5 years. Other Oakland subscribers such as the School District Public Safety and Oakland Public Works Agency are also in the same situation as BART and are not on the P-25 migration path in the near future. The option of gradual P-25 Migration via EDACS will allow for a mixture of EDACS and P25 channels to be used at each of Oakland's radio sites and will allow for continued use of non-P25 subscribers' gear during the process.

2. ***Ensure backward compatibility with all agencies which are not on the P25 migration path within the near future***

The proposed project upgrade will ensure the backward compatibility with these agencies and others that are not on the P-25 migration path within the near future. Additionally, in Oakland's current subscriber plan, when a subscriber radio is being replaced, a 7200 or above is being purchased to allow operation on EDACS and P25 channels.

3. ***Oakland will become one of three CORE cities in the Bay Area UASI and BayRICS to become P25 compliant in voice communications***

Moreover, this Hybrid P-25 Phased Deployment approach also assists and meets the main goal of BayRICS. The Phased Deployment approach for this project brings the Bay Area Region one step closer to its BayRICS vision of having the ability for any public safety radio in the region to communicate with any other public safety radio regardless of location, radio system or frequency band and to seamlessly roam throughout all 10 Counties in the Bay Area.

Oakland's approach will establish P-25 compliance for voice communications in one of the three CORE cities in BayRICS and the Bay Area UASI within the proposed 5 year timeline that was established in the, "Strategic Plan - Bay Area UASI Interoperable Communications Project dated February 29, 2008".

OAKLAND INTEROPERABILITY ROADMAP

The City of Oakland is part of the Bay Area Urban Area Security Initiative (UASI), and continues moving forward with the vision of BayRICS and the UASI in view, namely "the ability for any public safety radio in the region to communicate with any other public safety radio regardless of location, radio system, or frequency band and to seamlessly roam throughout all 10 Counties in the Bay Area."

The City of Oakland's radio system network is housed in three separate sites. The sites are referred to as APL, SENECA and GWIN. All sites are secure and equipped with Uninterrupted Power Supply (UPS) systems and in the future all sites will have back-up generators to ensure continuity of operations should there be a long term power outage. The GWIN site radio system network infrastructure has been upgraded to a full P-25 compliant system. The City of Oakland is the first city in the Bay Area to achieve full P-25 compliance at one of three of its radio system networks. The future plans include upgrading the SENECA site to full P-25 compliance by 2010 and Oakland has secured partial grant funding for accomplishing this goal and expects to receive additional grant funding to complete this site. The APL site will be the last site to become P-25 compliance. The City of Oakland is seeking grant funding and other funding sources to fund the costs of upgrading this final site. This is the largest site, a master site that will then tie all three sites together to ensure redundancy and to maximize radios capacity. The costs have been estimated to be around $5million dollars to gain full P25 compliance. The new P25 system will allow the new subscribers to seamlessly roam and experience the improved coverage throughout the City.

EXECTUIVE SUMMARY OF CTA REPORT

The CTA Communications Executive Summary provides a high level overview of the Interoperability Study report developed for the City of Oakland. This study was focused on providing the City of Oakland with a technical roadmap for improved operability within the City and increased interoperability with those agencies in the Bay Area Urban Area Security Initiative (UASI). The Interoperability Report describes the process CTA Communications used to arrive at a jointly developed plan for wireless voice and supporting interconnect systems. The report considers the existing public safety communications system design and presents design

alternatives based on available technology, frequency spectrum availability and operational feasibility.

This CTA study had 5 main goals or objectives:

1. Review and evaluate existing technology owned and operated by the City.
2. Establish a technical roadmap for full and seamless interoperability with BayRICS.
3. Provide a cost benefit analysis of the EBRCS JPA proposal.
4. Review the City's spectrum efficiencies (simulcast) and the leveraging of the City's equipment and investments as part of the EBRCS.
5. Provide recommendations for an interim solution for an Oakland EBRCS MOU.

RECOMMENDATIONS OF CTA REPORT

The final recommendations are substantiated by the detailed analysis and extensive documentation provided in the interoperability study report.

The CTA Interoperability Study recommends the following steps to be taken:

1. Complete the current 800 MHz rebanding effort.
2. Re-license the rebanded 800 MHz frequencies for a Simulcast System, with at least 100 Watts at each site. The key is to increase the Effective Radiated Power (ERP) at APL from 19 Watts to as much as 300 Watts.
3. Purchase an additional 500 portables to be issued to Oakland PD so that each officer has his own radio.
4. Verify if the coverage meets the needs of the users, after increasing power levels and upgrading sites following the rebanding effort,
5. Research the cost of upgrading the existing EDACS system to a Simulcast System. This research will be used to determine if current system needs exceed capacity, this might be a viable short term solution as the City of Oakland decides if they should build out their own system, or join EBRCS.
6. The existing Microwave upgrades should continue. Even if the City of Oakland joins EBRCS, the existing microwave loop could be incorporated into the EBRCS design. If the City builds its own system, the existing microwave system will need to be upgraded as planned.
7. Aggressively look for grant funding opportunities to pay for a City of Oakland P-25 radio system. If these grant funding sources can be found, then the City should move in this direction.
8. Aggressively work with EBRCS to ensure the current site selections are those that are used in the final design for the EBRCS ALCO Northwest Cell. Work closely with EBRCS and negotiate site sharing details for SENECA and APL.

9. Work with EBRCS to determine if a maintenance agreement can be put in place for the City of Oakland to provide all maintenance infrastructure and subscriber support for the agencies in the ALCO Northwest Cell. If an agreement can be made, it may be possible for the City of Oakland to defer most of the costs of joining EBRCS.

SUSTAINABLE OPPORTUNITIES

Economic:

There may be economic opportunities in the future for the City of Oakland, if other surrounding jurisdictions or other agencies determine that they want to be a part of Oakland's radio system network.

Environmental:

At this time there are no environmental opportunities related to this report.

Social Equity:

The City of Oakland continues to ensure that the Public Safety personnel are able to communicate during emergencies with minimal disruptions therefore providing first responders the ability to respond during emergencies to all of Oakland's residents and the community.

DISABILITY AND SENIOR CITIZEN ACCESS

In providing public safety emergency communications for first responders, the City of Oakland continues to meet all Americans with Disabilities Act (ADA) requirements and provide the highest level of service to all residents and to the community.

ACTIONS AND RECOMMENDATIONS

City of Oakland staff will continue to work closely with first responders and its regional partners, and Bay Area UASI towards full interoperability and P-25 compliance.

Staff recommends that City Council continue to provide leadership and support of the efforts by the Department of Information Technology, Office of Emergency Services, Oakland Fire and Oakland Police to move towards Public Safety Voice Interoperability and P-25 compliance.

ACTION REQUESTED OF THE CITY COUNCIL

Staff recommends that the City Council accept this informational report.

Respectfully submitted,

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